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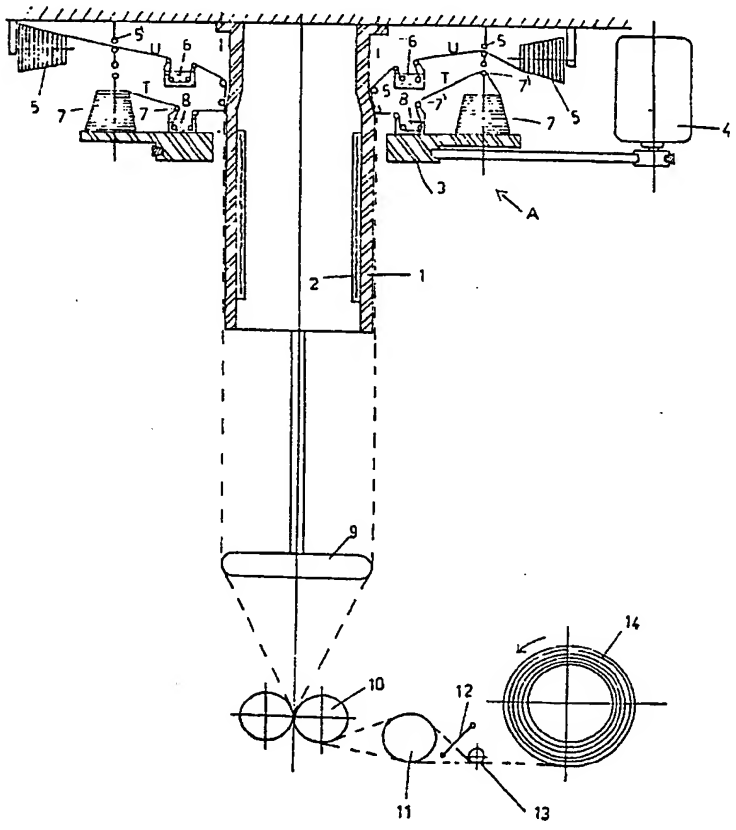
(54) Title: DEVICE AND PROCEDURE FOR MANUFACTURING TUBULAR CLOTHS

(57) Abstract

Device and process for manufacturing tubular cloths, comprising a vertical tube (1), internally heated (2), having a rotating table (3) around tube (1), also sliding along its length, so as to distribute warping yarns along the center line of the tube, and texture yarns transversally thereto, said yarns adhering by overlapping, thus shaping a continuous tube, which is cut alongside of its center line, forming a strip of cloth.



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" DEVICE AND PROCEDURE FOR MANUFACTURING TUBULAR CLOTHS ".

Said patent of invention relates to a " DEVICE AND PROCEDURE FOR MANUFACTURING TUBULAR CLOTHS ", through a simple overlapping and binding of the yarns normally shaping the warping and the texture. Said yarns, without being known, are bound by adherence, thus shaping a cylindrical continuous tube, which is further cut at its side, toward the center line of the tube, so as to finally form a strip of "non-woven cloth".

The process herein referred to allows a high speed production of cloth.

By using a simple equipment, it is possible to form figures and drawings, through variation of the gaps among the yarns. On the other hand, the lengthening of the cloth forced by stress, either by the yarns of the texture or the warping, is practically negligible, since it is so small. Said fact constitutes one of the advantages of the product obtained through the process herein discussed.

Attached hereto are drawings illustrating this invention, as follows: figure 1 is a general view of the equipment intended to produce the cloth referred to; figure 2 is a view of the upper part of the device, and figure 3 is a view of the lower thereof; figure 4 is an example of a drawing obtained in the cloth, through the application of a mechanism intended to the drawing, which is showed at figure 5; figure 6 shows a transversal view, with an example of the cloth produced in two overllaped layers.

Acoording to the prior weaving art, the yarns in the warping are taken by the shuttle through the yarns of the texture, so as to comprise the texture. Presently, the weaving frames to produce coths are extremely fast. But, the process used according to the object of the present invention is much faster, since no weaving of the yarns occurrs; the yarns comprising the warping, through an extremely fast rotating motion, are coiled around the yarns of the texture and, at the same time, are "forged" on each other, so as to make a solid tubular shaped screen, which is further cut alongside the tube's center line, so as to shape a strip of cloth that was much more rapidly obtained, with a noticeable decrease of cost. As already said, it is possible to determine, through a simple mechanical device, the approach or slaying of the

transversal yarns, in such a way that the most varied possible drawings may be made.

One of the main applications of this "non-woven cloth" is the manufacture of a waterproof canvas, which is obtained by application of a thermoplastic film on the faces of the cloth, or through a waterproofing paste, gelatinized by means of heat. The canvas so manufactured is used as oil-cloth and tents, containers and even as pneumatic structures for storage purposes.

The canvas obtained by the prior art process, according to which its structure is made of cloth, by means of weaving frames, has the disadvantage of being lengthened as in the same line of the warping, upon stress, which obviously decreases its waterproofing qualities, thus making the canvas damaged.

The lengthening or stretching due to stress, either in the warping or the texture yarns are practically avoided in the cloth obtained through the device object hereof, since there is already a "binding" in every point each yarn of the warping touches each yarn of the texture, in such a way that the canvas made with this cloth cannot be stressed. Therefore, its intrinsic qualities are not changed, and since the so called "binding" among the yarns is obtained through a high frequency "weld", it

is extremely resistant, for there is a welding of the material, which implies a practically indestructible binding, under normal usage.

On the other hand, taking into account that the binding of the yarns makes a much more resistant cloth, it is possible to use a lower diameter and number of yarns, with a consequent lower cost of the cloth.

It is also foreseen the adherense among the yarns of the warping and the texture, by means of a special adhesive that also assures the strength of the product.

The object of this patent of invention is a " DEVICE AND PROCESS FOR MANUFACTURING TUBULAR CLOTHS ", from a sinthetic material yarn, and comprised by a flat surface tube (1), with and internal continuous tubular resistance (2), coaxial with said tube, near one of its ends, there is a rotating table (3), conveniently driven by external means (4), said table being allowed to move around the tube and, at the same time, to slide along its length, in such a way that, by moving so, the yarns of the warping (U) and the texture (T) shall be distributed. There are provided reels (5), conveniently fixed to the support where the tube (1) is bound, said reels containing the yarns of the warping, with guides (5') to facilitate the unwinding of the yarns and guide the position of said

yarns (U), which pass previously by a vessel containing adhesive. Other reels (7) are located on the rotating table, with the yarns (T) of the texture, which pass by guides (7') through tubs (8) also containing adhesive and through cams that guide their position in relation to the cylindrical body (1) and, therefore, in relation to the yarns (U) of the warping. At the end opposite to the rotating table coaxial to the body (1) there is a guide (9) for the tubular shaped cloth, with the shape of a cylindrical ring, with rounded edges.

Beyond said guide (9), there is a stressing device of the warping yarns, already in the woven tubular set, which passes through an internal circular guide (11), intended to keep the cloth distended with the shape of a tube, guiding it toward a cutting means (12) conveniently located, which cuts the cloth toward the tube's center line, after which this latter passes through a linear guide (13), transversal in relation to the strip, thus permitting the coiling (14), as a plane or strip.

There may be a guiding system (14) on the rotating table, which system is guided by fixed cams (15), move the yarns (T), so as to create an infinite variaton of drawings in the final cloth, as disclosed in the figure 4.

C L A I M S

1st.) " DEVICE AND PROCESS FOR MANUFACTURING TUBULAR CLOTHS ", from a shynthetic material yarn, the feature of which is to be comprised by a flat surface vertical tube (1), with internal continuous tubular resistance (2), coaxial to said tube; near its upper end there is a rotating table (3), conveniently driven by external means (4), table intended to turn around the tube and, at the same time, slide along its length, so as to distribute along the tube the warping (U) and the texture (T) yarns.

2nd) " DEVICE AND PROCESS FOR MANUFACTURING TUBULAR CLOTHS ", according to claim 1, whose feature is to have conveniently located, on the support of the tube(1)reels(5)containing the warping yarns with guides(5')that facilitate the unwinding of the yarns and guide the position thereof, said yarns passing previously by a vessel (6) containing adhesive; on the rotating table (3) there are other reels (7) with the texture (T) yarns, which pass through guides (7'), through tubs (8), also containing adhesive, and through cams guiding their

position in relation to the yarns (U) of the warping; at the end opposite to the rotating table coaxial to the body (1) there is a guide (9) for the cloth, which is a tubular shaped guide, with cylindrical ring form, with rounded edges.

3rd) " DEVICE AND PROCESS FOR MANUFACTURING TUBULAR CLOTHS ", according to the above claims, whose feature is that, beyond said guide (9), there is a stressing means (10) of the warping yarns, already in the woven tubular means, which passes through a stressing internal circular guide (11), to the tube-shaped cloth, guiding it toward a convenient cut means (12), which cuts the cloth toward the tube's center line, after which it passes through a linear guide (13), transversal to the strip, allowing the consequent winding (14) as a plane or strip.

4th) " DEVICE AND PROCESS FOR MANUFACTURING TUBULAR CLOTHS ", according to claim 1, whose feature is to have on the rotating table a guiding system (14) which, guided by fixed cams (15), move the yarns (T), so as to create drawings in the final cloth, as disclosed in the figure 4.

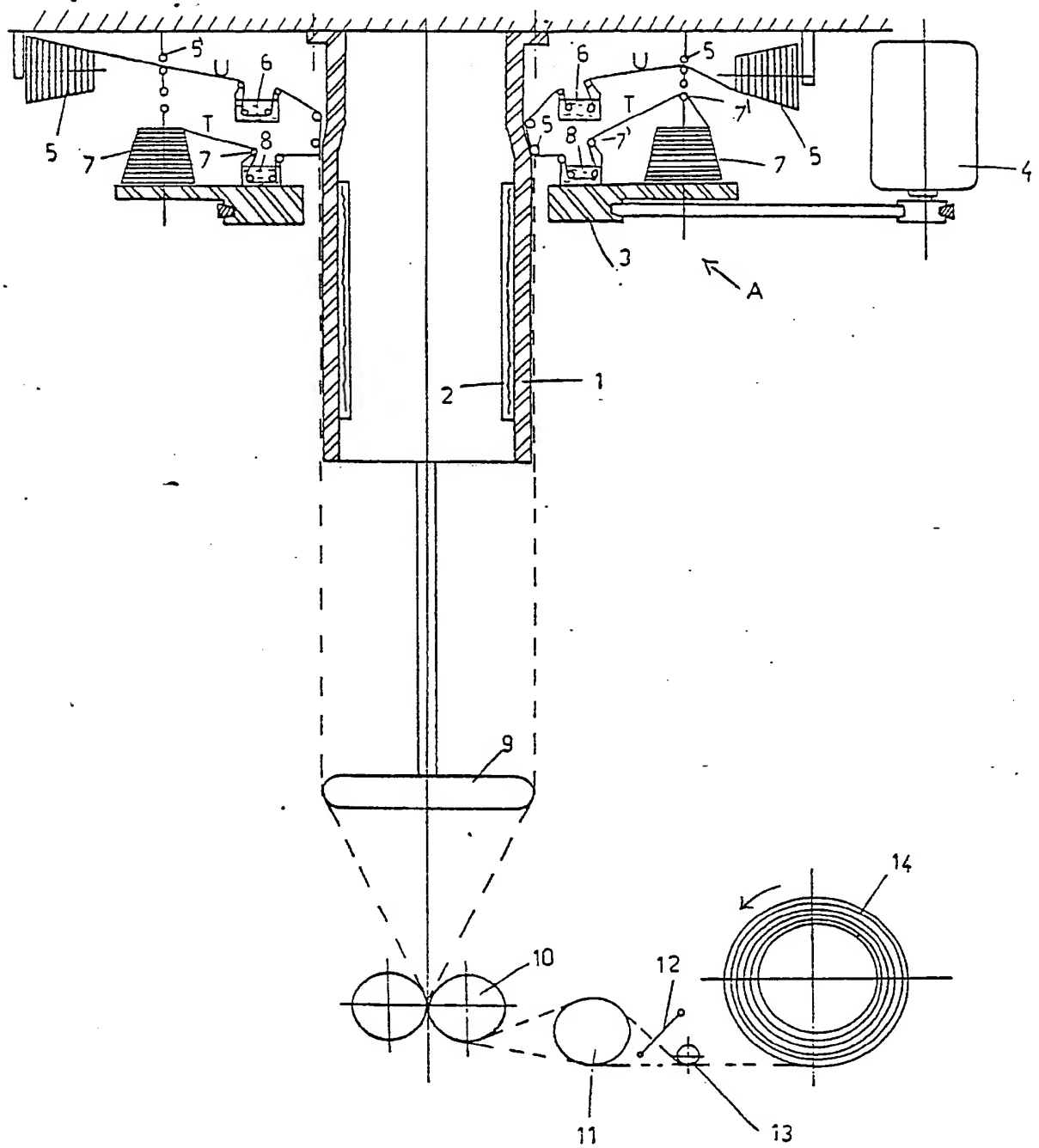

FIG-1

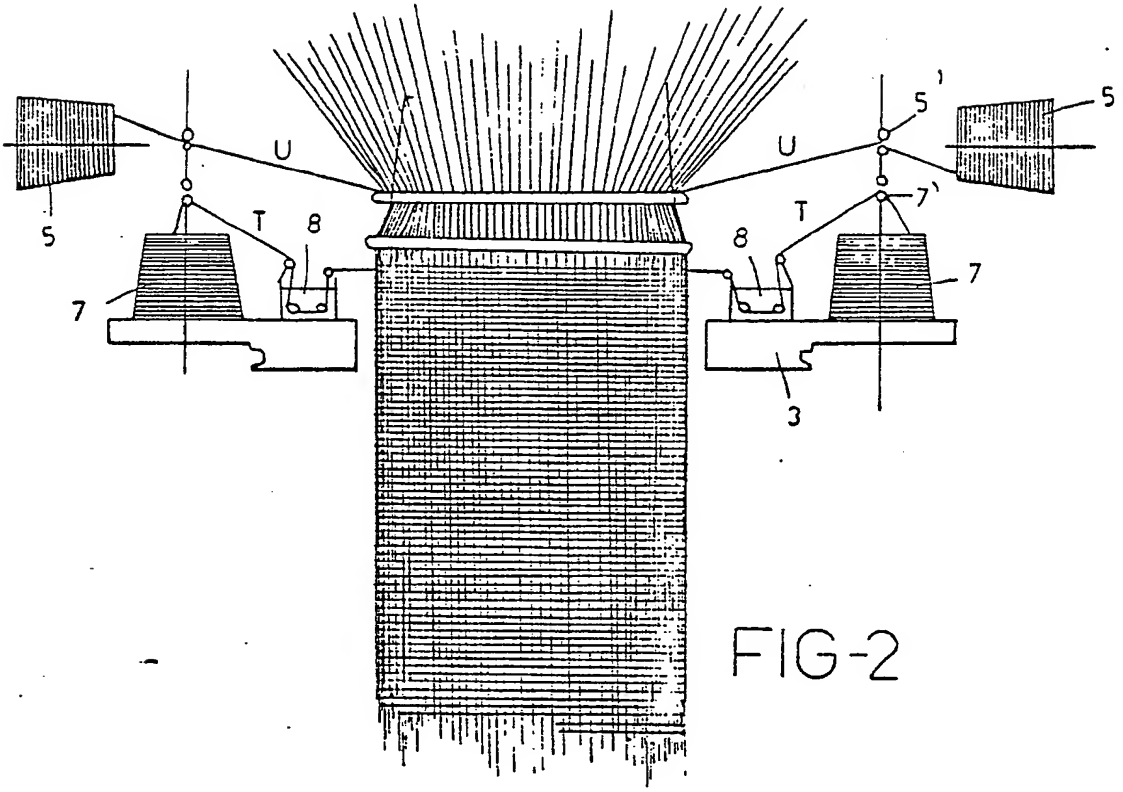

FIG-2

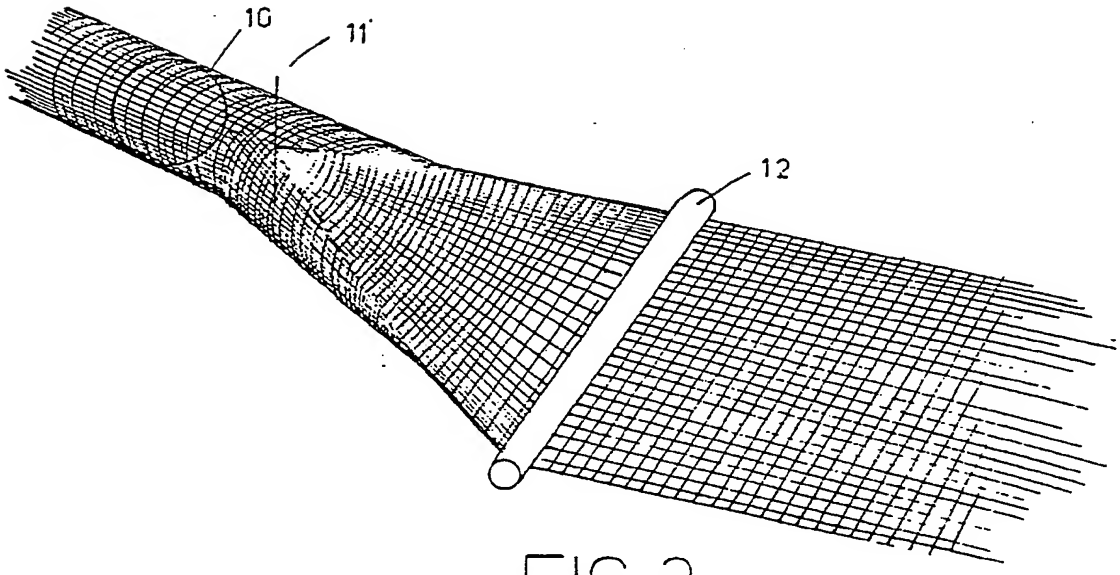

FIG-3

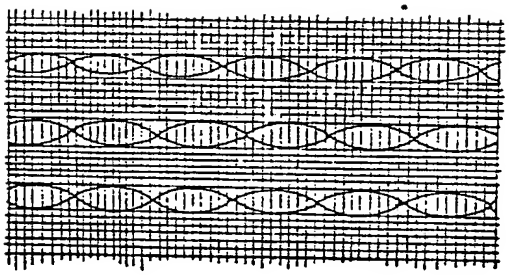

FIG-4

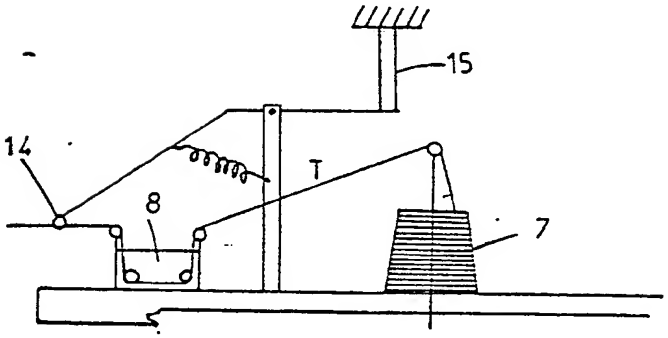

FIG-5

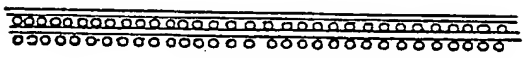

FIG-6

INTERNATIONAL SEARCH REPORT

International Application No PCT/BR 79/00005

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC

D04H 3/04 Int. Cl. 156/174
B65H 81/00 US. CL. 156/426

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
US	156/167, 174, 177, 271, 426, 433, 439, 440, 441

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [5]

NONE

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
X	US, A, 2,797,728, Published 02 JULY 1957, Figs. 1, 2, 9, col. 5, ll. 55-71 SLAYTER ET AL.	1-3
X	US, A, 3,342,664, Published 19 SEPTEMBER 1967, Figs. 1-3 STUTZ	1-3
X	US, A, 3,384,521, Published 21 MAY 1968, Figs. 1-3 BORUP	1-3
X	US, A, 3,391,039, Published 02 JULY 1968, Figs. 1, 2 BASCOM ET AL.	1-3
X	US, A, 3,475,264, Published 28 OCTOBER 1969, Figs. 7-8, col. 1, ll. 65-71 DONALDSON	4
X	US, A, 3,855,036, Published 17 DECEMBER 1974, Figs. 1-2 SOLBECK	1-3
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IV. CERTIFICATION

Date of the Actual Completion of the International Search [2]

13 SEPTEMBER 1978

Date of Mailing of this International Search Report [2]

24 SEP 1979

International Searching Authority [1]

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MICHAEL W. BALL

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